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agrees with the analysis made by Gemelli, does not affect the fact that such an attempt is a step decidedly in the right direction. It would appear to the reviewer that Gemelli has made a more complete analysis of the particular consciousness under observation than has yet been done in any of the Würzburg studies. And this analysis has been made from a purely psychological attitude toward the problem and without any appeal to philosophy. Unfortunately, it seems to the reviewer, that Gemelli does not publish sufficient introspections to confirm his analysis.

Clark University.

SAMUEL W. FERNBERGER.

The Influence of Distractions on the Formation of Judgments in Lifted Weight Experiments. By DAVID MITCHELL, Ph. D. The Psychological Monographs, Vol. XVII, No. 3 (Whole No. 74), 1914. pp. 58.

On the basis of introspection most psychologists have divided attention into at least two sorts—voluntary and involuntary. It is the purpose of this investigation to induce two states of mind which may be characterized by these terms and to study the influence of each upon the formation of judgments. The experiments were carried on in the field of lifted weights. The space errors were eliminated and the weights were presented in the first time order. Two types of sound distractions were employed: 1. a continuous sound made by an electric buzzer to which the subject was instructed not to attend, and 2. the counting of separate clicks—from one to six in number—simultaneously with the lifting of the comparison stimulus. "In the first group the distraction was produced by a sensory stimulation without a concomitant mental activity otherwise induced. In the second group, the work of counting the clicks was a prominent feature of the mental process involved" (p. 33). That Mitchell succeeded in inducing the desired states of mind by means of these distractions is attested by the reports of the observers.

The apparatus employed for the production of the distractions was rather complicated but exceedingly clever and efficient. It was necessary to have the distracting sound exactly, or almost exactly, concomitant with the lifting of the proper weight. This the experimenter obviously could not do. So Mitchell devised a means by which the actual lifting of the weight mechanically actuated the distracting stimulus. Hence the differences in time between the lifting of the weight and the starting of the distraction were exceedingly small.

The experiments were so arranged that normal series without distractions were mingled with the distraction series of both types and so were taken under the same objective and subjective conditions. Four subjects were employed in this investigation and in all over 75,000 individual judgments were recorded; a number amply sufficient to give authority to the results. The data was collected in accordance with and subjected to the calculations of the method of constant stimuli as developed by Urban.

The results show that, contrary to the traditional view, a distraction such as those employed in this experiment tends to produce greater precision of judgment; or in other words, in the presence of a distraction the judgments of the subject are more consistent. This is shown by the greater size of the value of h of the $\Phi(\gamma)$ hypothesis for the series in which the distractions were present. Also this presence of distractions increases the sensitivity of the subject. The

interval of uncertainty is much smaller for the series in which the distractions were present than it is where there were no distractions. This influence is seen to be present upon both of the thresholds in the directions of increase and decrease, *i. e.*, both thresholds tend to more nearly approach one another. The influence is greater, however, on the threshold in the direction of increase. These results are in accord with those from the Cornell Laboratory of a few years ago. As a result of this greater influence upon the upper threshold, the point of subjective equality is shifted and assumes a slightly lower value for the series with distractions. Hence the conclusion is drawn that the presence of a distraction causes an overestimation of the weight. This is in contradiction with the traditional view which holds, to express it in positive terms, that an increase of attention tends to increase the intensity of the sensation. This shift of the point of subjective equality is relatively small however.

Perhaps Mitchell's most striking results are those obtained when we compare the different final values furnished by the distraction series, where the distraction was a continuous sound to which the subject did not attend actively; and the other, where the distraction was the active counting of discrete clicks along with the lifting of the comparison stimulus. It is found that the coefficient of precision, the intervals of uncertainty, and the points of subjective equality for these two series are, on the average, almost identical. Hence we may conclude that both types of attention or distraction had approximately the same effect upon the formation of the judgments. It is difficult to believe that two mental states that are introspectively so apparently different should have such similar effects; but, nevertheless, the results of this investigation show that this is the case. Two alternative hypotheses are advanced in explanation of this difficulty. 1. It is suggested that our introspection may not be one of attention itself, but rather of the conditions of attention, and that the processes of attention may be the same whether voluntarily or involuntarily initiated. 2. It may be that introspection gives us the subjective aspect of two very different sorts of process but that these may be of such a nature that the differences succeed in counteracting one another in such a way as to neutralize themselves and so bring about identical results.

This paper is exceedingly significant inasmuch as it is another successful attempt to extend the application of the psychophysical methods beyond the domain of sense-perception. The paper also opens up a very interesting group of problems that must be solved by future research. Furthermore, it indicates most clearly that an introspective analysis, even though complete, is not the final goal of psychology. Because we must then answer the question as to what is the effect of this combination of structural factors. Mitchell gives his numerical results with great fullness so that his study may be more easily comparable with the results of future investigations. He also includes a number of charts of the curves of the psychometric functions of the different judgments under these different conditions, so that the reader has a graphic presentation of these relationships that is exceedingly helpful.

Clark University.

SAMUEL W. FERNBERGER.